Year 6 maths – Summer 2 Week beginning: 6.7.20							
Theme	Volume (Lesson 4 of 5) Finding the volume of cubes and cuboids.	Volume (Lesson 5 of 5) Solving problems involving the volume of solids	CONSOLIDATION LESSON Formal methods Multiplication	CONSOLIDATION LESSON Formal methods Division	CONSOLIDATION LESSON Formal methods Multiplication and division		
Factual fluency (to aid fluency)	Practise adding and subtracting decimals <u>Activity</u>	Practise using decimals in word problems <u>Activity</u>	Practise the four operations <u>Activity</u>	Practise the four operations with decimals <u>Activity</u>	Practise the four operations word problems <u>Activity</u>		
Problem/ activity of the day Remember, just like in class, you can still show the depth of your knowledge LINK	<ul> <li>(Lesson ) resources below)</li> <li>MAKING LINKS: Last week, we found the volume of figures. Today we are continuing with that.</li> <li>THINK: (support below)</li> <li>Can you help me with this? My friend says that if a box has sides that are 12 mm long and the smaller box has sides that are 6 mm long, the big box must have a volume that is double the smallest box. Is this true?</li> <li>Our problem is on textbook page 111. Look at it now.</li> <li>SEE: (model below)</li> <li>If you want a reminder of how we calculate volume you can watch the year 5 lesson video here as a recap.</li> <li>Look for how to solve the problem on page 111-112 of your textbook.</li> <li>DO: Use what you have learnt today to solve:</li> <li>Part 1: complete the questions from textbook page 113.</li> <li>Check your answers before moving onto:</li> <li>Part 2: Workbook, Chapter 11, worksheet 4, page 95.</li> </ul>	<ul> <li>MAKING LINKS: Yesterday we found the volume of figures. Today we are going to solve problems involving volume.</li> <li>THINK: (support below)</li> <li>Can you help me with this problem? A solid metal cuboid was melted down to make cubes with 4cm sides. What is the greatest number of cubes that can be made with the volume of the melted cuboid? Our problem is on textbook page 114. Look at it now.</li> <li>SEE: (model below)</li> <li>A reminder of how we calculate volume can be seen in the year 5 lesson video here.</li> <li>Look for how to solve the problem on page 114, method 1 in your textbook. You may use a calculator for this task.</li> <li>DO: Use what you have learnt today to solve: Part 1: complete questions 1 and 3 from textbook, Chapter 11, worksheet 5, page 96-97.</li> </ul>	<ul> <li>(Lesson 3 resources below)</li> <li><u>MAKING LINKS:</u> In year 4, 5 and 6 we learnt to use the formal, vertical method to multiply. Today we are going to recap that method.</li> <li><u>THINK: (support below)</u></li> <li>If there are 114 flats in each block of flats, how many flats are in 24 identical blocks?</li> <li>If you have online parent access this lesson is based on Year 6 textbook 6A, chapter 2, lesson 6.</li> <li><u>SEE: (model below)</u></li> <li>Check the solution below.</li> <li><u>DO:</u> Use what you have learnt today to solve:</li> <li><u>PART 1;</u> Complete the questions in part 1 below.</li> <li>Check your answers below before moving on to:</li> <li><u>PART 2;</u> Complete the questions in part 2 below.</li> </ul>	<ul> <li>(Lesson 4 resources below)</li> <li><u>MAKING LINKS:</u> In year 4, 5 and 6 we learnt to use the formal method to divide. Today we are going to recap that method.</li> <li><u>THINK: (support below)</u></li> <li>7192 people registered for a national sports camp. How many teams of 31 will there be at the camp?</li> <li>If you have online parent access this lesson is based on Year 6 textbook 6A, chapter 2, lessons 11.</li> <li><u>SEE: (model below)</u></li> <li>Check the solution below.</li> <li><u>DO:</u> Use what you have learnt today to solve: PART 1: Complete the questions in part 1 below.</li> <li>Check your answers below before moving on to: PART 2: Complete the questions in part 2 below.</li> </ul>	<ul> <li>MAKING LINKS: This week we recapped the formal methods to multiply and divide. Today we are going to use those methods in solving word problems.</li> <li>THINK: (support below) Can you help me with this problem? We have 12 boxes of pencils. Each box of 96 pencils costs £15. The pencils are packed into boxes of 5, which are sold at £1.90 per box. If a shop sells all of these boxes what is its profit?</li> <li>If you have online parent access this lesson is based on Year 6 textbook 6A, chapter 2, lesson 16.</li> <li>SEE: (model below) Check the solution below.</li> <li>DO: Use what you have learnt today to solve: PART 1: Complete the questions in part 1 below.</li> <li>Check your answers below before moving on to: PART 2: Complete the questions in part 2 below.</li> </ul>		

See below for resources to support you to THINK-SEE-DO



#### DAY 1 RESOURCES:

**<u>THINK</u>**: Our problem is on <u>textbook</u> page 111.

My friend says that if a box has sides that are 12 mm long and the smaller box has sides that are 6 mm long, the big box must have a volume that is double the smallest box. Is this true?

**<u>DO:</u>** Use what you have learnt today to solve: Part 1: complete the questions from textbook page 113.

Notice the sides on cube shaped boxes are changing by 3cm each time.

Check your answers before moving onto: <u>Part 2</u>: Workbook, Chapter 11, worksheet 4, page 95.

# <u>SEE:</u> Reminder yourself of how we calculate volume by watching the year 5 lesson video <u>here</u> as a recap.

Look for how to solve the problem on page 111-112 of your textbook.

<u>Remember</u>: We calculate volume of a cube or cuboid by multiplying its length, width and height. volume = width x length x height



Every side on a cube is the same length, so we multiply the same amounts. The volume of the smallest box at the top

is: W x I x h = 6 x 6 x 6 = 6 x 6 = 36 x 6 = 216 mm<sup>3</sup> w x I = 36 x h = 36 x 6 = 216 mm<sup>3</sup>

The volume of the largest box at the bottom is:  $w \times 1 \times h = 12 \times 12 \times 12 = 144 \times 12 = 1728 \text{ mm}^3 = \frac{144}{288} + \frac{12}{288} + \frac{144}{288} + \frac{14}{288} + \frac{14}{288$ 



Although the length of the sides of the smallest cube are half the length of the largest the volume of the smallest cube is not half the volume of the largest cube!

1728



#### DAY 2 RESOURCES:

## **<u>THINK</u>**: Our problem is on <u>textbook</u> page 114.

A solid metal cuboid was melted down to make cubes with 4cm sides. What is the greatest number of cubes that can be made with the volume of the melted cuboid?



**Remember:** when the cuboid has been melted <u>all</u> the volume can be used to make the smaller cubes.

#### <u>DO</u>:

Use what you have learnt today to solve:

Part 1: complete questions 1 and 3 from textbook pages 115-116.

Check your answers before moving onto: <u>Part 2</u>: Workbook, Chapter 11, worksheet 5, page 96-97.

## Do not complete question 3.

**SEE:** Look for how to solve the problem on method 1 on page 114 of your textbook. You may use a calculator for this task.

Remind yourself of how we calculate volume in this year 5 lesson video <u>here</u>.

First, calculate the volume of the metal cuboid so you know the amount that will be divided amongst the small cubes with 4cm sides. **Remember, volume = I x w x h** Length x width x height

Then calculate the volume needed for each of the cubes:

20 cm 20 cm

volume of metal cuboid = (20 × 20 × 30) cm<sup>3</sup>

= 12 000 cm<sup>3</sup>

volume of each cube =  $(4 \times 4 \times 4)$  cm<sup>3</sup> = 64 cm<sup>3</sup>

Then divide the volume of the melted cuboid between the volume of the small cubes (use a calculator):

12 000 ÷ 64 = 187.5 number of cubes = 187

Note: the volume divides with a result of 187.5 The 0.5 is not a complete cube so only 187 cubes can be made!



#### DAY 3 RESOURCES:

**<u>THINK</u>**: If there are 114 flats in each block of flats, how many flats are in 24 identical blocks?

If you have online parent access this lesson is based on Year 6 textbook 6A, chapter 2, lesson 6.

#### <u>DO:</u>

Part 1: complete the questions below: a)  $217 \times 14 =$ b)  $18 \times 105 =$ 

c) 1028 x 13 = d) 19 x 1116 =

uj 17 x 1110

Check your answers before moving onto: Part 2:

2054	2089	1344	1125	1344
<u>x 45</u>	x 56	<u>x 87</u>	x 35	<u>x 71</u>
1198	1657	2080	1769	1187
<u>x 56</u>	<u>x 48</u>	<u>x 48</u>	<u>x 97</u>	<u>x 55</u>
1774	2353	2090	1489	1096
<u>x 37</u>	x 51	x 90	x 43	x 25

# <u>SEE:</u> Recap the formal multiplication methods we learned in year 5, watch the <u>steps</u> for formal multiplication here and the year 5 <u>lesson</u> video here.

114 x 24 is the equation I need to solve.

First, write the equation in a vertical form.					1 1	4
Ones in the ones place (or column), Tens in the tens place (or column), Hundreds in the hundreds place (or column).						
Multiply by the ones, 114 x 4		th 11	en l 14 x	oy tł 20	ne te	ens.
1 1 4				1	1	4
× 4			×		2	0
4 5 6			2	2	8	0
Finally add the two amounts to reach the total.	×	1	1	4		

#### 456 + 2280

When multiplying 4-digit numbers you will need to include a thousands place.



#### DAY 4 RESOURCES:

<b>THINK:</b> 7192 people registered for a national sports camp. Howmany teams of 31 can will there be at the camp?If you have online parent access this lesson is based on Year 6 textbook6A, chapter 2, lesson 11.	SEE: Recap the division methods we learned in year 5 by watching the year 5 division lesson video here. Before we move onto division remind yourself of the language we use in division. We learnt this in year 4 and year 5: $quotient \rightarrow 5$ divisor $\rightarrow 3$ 16 dividend 15				
Part 1: complete the questions below: a) $385 \div 11 =$ b) $572 \div 52 =$	Remember your steps for division:remainder→1Write down the multiples of the divisor so that we can easily recognise how many we have in the dividend.				
c) $288 \div 24 =$ d) $408 \div 17 =$	In this division problem we need to find <u>how many groups of 31</u> there are in <b>7192</b> so we jot down the multiples of 31:				
Check your answers before moving onto: Part 2:	31, 62, 93, 124, 155, 186, Now I could partition the dividend into multiples of 31.				
16)754 16)992 64)2432 65)5200	I can see 62 is a multiple of 31 so 6200 will be too! 6200 is 200 groups of 31 (200 x 31) (200 x 21)				
56)5376 68)5403 98)4018 19)624	$(6200 \div 31 = 200)$ $31 \int 7 \ 1 \ 9 \ 2$ That leaves 992. $-6 \ 2 \ 0 \ 0$ 9 9 2				
95)1351 69)5126 67)2028 61)4636	I know I can find more multiples of 31 in 930 because 93 is a multiple of 31 so 930 will be too! $(30 \times 31 = 930)$ $(930 \div 31 = 30)$ $- 9 3 0 \rightarrow 930 \div 31 = 30$ 0 $- 6 2 \rightarrow 62 \div 31 = 2$ $0$				
	That leaves 62 remaining. 62 is a multiple of 31. 2 x 31 = 62 ( 62 ÷ 31 = 2)				
	Finally, I can see how many 31s were in 7192. 200 + 30 + 2 = 232 2 Hundreds + 3 Tens + 2 Ones				



#### DAY 5 RESOURCES:

<b><u>THINK</u></b> : We have 12 boxes of pencils. Each box of 96 pencils costs £15. The pencils are packed into boxes of 5, which are sold at £1.90 per box. If a shop sells all of these boxes what is its profit?	SEE: Look at the videos on the previous two days if you need a reminder of how to multiply and divide using formal methods. When solving word problems we must:		
If you have online parent access this lesson is based on Year 6 textbook 6A, chapter 2, lesson 16. DO: Part 1: complete questions below. Q.1: A shop orders 800 containers of Iollies. It tries to distribute all of them equally amongst its 17 sweet shops. How many Iollies does each shop get?	<ol> <li><u>Understand</u> the problem (read it and visualise the problem as you read)</li> <li>Make a <u>plan</u> on how you will tackle the problem – what calculations will you need to do, what will your bar model look like, how many steps will you need to tackle?)</li> <li><u>Solve</u> the calculations needed to reach an answer.</li> <li><u>Check</u> that your answering sentence or statement makes sense</li> </ol>		
Q.2: Amelie has 2,000ml of juice. She fills each ice-lolly mould with 75ml of juice. How many ice lollies can she make and how much juice will be left? Belle has 2,500ml of juice and she use 95ml of juice for each ice lolly. Will she have more or less juice left than Amelie?	Don't stop at the calculation point. Word problems require a 'word' answer! In today's problem:		
<u>Part 2</u> : Complete the questions below: Q.1: Manchester Furniture needs to ship 972 sofas across the	12 x 96 = 1152 pencils 12 x $\pounds$ 15 = $\pounds$ 180 (the cost for the boxes of pencils)		
country. If they can fit 12 sofas in each truck, how many trucks should the company plan to use?	1152 ÷ 5 = 230 boxes remainder 2 pencils		
Q.2: A new car park is going have 510 parking spaces. If each row can have 17 parking spaces, how many rows will the car park need?	230 x £1.90 = £437 (the amount of money gained from selling the boxes of pencils)		
Q.3: Keith's shelves hold 39 books each. How many shelves will Keith need if Keith has 312 books? Q.4: Keith has 315 red marbles and 20 blue marbles. Keith has 35 times more red marbles than Joan. How many red marbles does Joan have?	£437 - £180 = £257 profit The shop made a profit of £257.		



Q.5: Sally bought 645 crayons that came in packs of 15. How many packs of crayons did Sally buy?	
Q.6: There were a total of 143 football games in the season. The season is played for 13 months. How many football games were played each month, if each month has the same number of games?	
Q.7: Sam has 215 black balloons. Sam has 43 times more black balloons than Tom. How many black balloons does Tom have?	
Q.8: There were a total of 304 rugby games in the season. The season is played for 19 months. How many rugby games were played each month, if each month has the same number of games?	
Q.9: There are 31 children in the classroom, each student will get 14 pencils and 41 erasers. How many pencils will the teacher have to give out ?	
Q.10: 3,600 seconds in an hour. How many seconds are there in a day?	



# <u>ANSWERS – part 1:</u>

<u>Day 1</u>	<u>Day 2</u>	<u>Day 3</u>	<u>Day 4</u>	<u>Day 5</u>
Part 1: Q.1: 512mm <sup>3</sup> Q.2: a) 120mm <sup>3</sup> b) 1200mm <sup>3</sup> Q.3:	Part 1:         Q.1: 9,000 cm <sup>3</sup> ÷ 420 cm <sup>3</sup> =         21.4         21 bottles can be filled.         Q.3: The melted cube is:         100 cm x 100 x100 =         1,000,000 cm <sup>3</sup> ,	Part 1: a) $217 \times 14 = 3038$ b) $18 \times 105 = 1890$ c) $1028 \times 13 = 13,364$ d) $19 \times 1116 = 21,204$	Part 1: a) $385 \div 11 = 35$ b) $572 \div 52 = 11$ c) $288 \div 24 = 12$ d) $408 \div 17 = 24$	Part 1: Q.1: Each shop gets 47 Iollies. Q.2: a) Amelie makes 26 ice Iollies. She has 50ml left. b) Bella makes 26 ice Iollies
a) 27mm³ b) 3375mm³	The smaller cuboids made from the melted cube are: $20 \text{ cm} \times 30 \times 10 = 6,000 \text{ cm}^3$ $1,000,000 \div 6,000 = 166.6666$ No, it is not possible to make 167 cubes as the volume is not enough.			but has 30ml left. She has less left than Amelie.



# ANSWERS – part 2 and deepening:

<u>Day 1</u>	<u>Day 2</u>	<u>Day 3</u>	<u>Day 4</u>	<u>Day 5</u>
Part 2: Q.1: a) 216mm <sup>3</sup> b) 343mm <sup>3</sup> c) 4,608mm <sup>3</sup> d) 540mm <sup>3</sup>	Part 2: Q.1: 50,000 ÷ 8 = 6250 cubes can be made. Q.2: 162,000 ÷ 750 = 216 bottles can be filled Do not do question 3. Q.4: 15,625 ÷ 2500 = 6 and a quarter buckets are needed.	Port 2:         2054         2089         1344         1125         1344 $\frac{x}{92430}$ 116984         116928         39375         95424           1198         1657         2080         1769         1187 $\frac{x}{56}$ $\frac{x}{48}$ $\frac{x}{97}$ $\frac{x}{55}$ $\frac{1198}{67088}$ 1657         2080         1769         1187 $\frac{x}{67088}$ 79536         99840         171593         65285 $\frac{1774}{65638}$ 2353         2090         1489         1096 $\frac{x}{37}$ $\frac{51}{2120003}$ $\frac{x}{188100}$ $\frac{64027}{64027}$ $\frac{27400}{27400}$	Part 2: $\frac{47 r^2}{16)754}$ $\frac{62}{16)992}$ $\frac{38}{64)2432}$ $\frac{80}{65)5200}$ 56)5376 $68)5403$ $98)4018$ $19)62495)5376$ $68)5403$ $98)4018$ $19)62495)5126$ $67)2028$ $61)4636$	Part 2: Q.1: 81 trucks Q.2: 30 rows Q.3: 8 shelves Q.4: 9 red marbles Q.5: 43 packs Q.6: 11 games Q.7: 5 black balloons Q.8: 16 games Q.9: 434 pencils Q.10: 86,400

